

*Field Trials.*—Field-strain trials in conjunction with the Department of Agriculture are being continued. Most of the present trials in operation are to test the value of short-rotation rye-grass in the field. Trials recently sown down include one at the Animal Research Station at Manutuke, Gisborne, and one on the Massey Agricultural College sheep-farm.

*Trials in Great Britain.*—The results to date on the R.A.S.E. trials have shown that New Zealand *certified* types will play a very valuable part in seed mixtures for use in lowland England. The fact that New Zealand *uncertified* types are of distinctly inferior value under English conditions has also been demonstrated in these trials. A further consignment of pedigree and certified seeds has been forwarded to England for the continuation and extension of this type of trial, which should do a great deal towards establishing our New Zealand selected strains on the English market.

#### FIELD ECOLOGY

(a) *Influence of the Animal in Pasture-production.*—This trial has now been terminated. The following figures give total dry-matter yields for the four-year period of the trial :—

	Pounds D.M. per Acre.	Relative Yields.
No return of residues .. .. .	44,209	100
Full return of residues .. .. .	58,497	133
Return of dung only .. .. .	51,625	116
Return of urine only .. .. .	50,122	113

It is a matter of considerable interest that the total extra growth obtained from the return of urine and dung individually tallies very closely with that obtained when returned together in the full-return treatment. The influence of a pedigree white clover throughout these trials has been very marked, and this has tended to equalize yields between no animal return and where the return of residues have taken place. Throughout the trial 4 cwt. superphosphate per acre was used.

(b) *Pasture-measurement Technique.*—Three systems of pasture measurement have been employed :—

- (1) The system of small self-contained paddocks rotationally grazed and measured by motor mower strips prior to grazing :
- (2) Small replicated plot system within a common enclosure where the animal residues are collected and are then returned to each plot in proportion to the amount of herbage produced by each plot :
- (3) Small replicated plots within a common enclosure where the stock residues are returned indiscriminately over the plot series within the enclosure.

Each technique system has presented difficulties, and a good deal more work is required on "technique" work before reliable small-scale trials can be devised.

(c) *Production Trials of Station-bred Pasture Types.*—These have been conducted to guide the plant-breeder and to demonstrate bred material under comparative broadcast trials under the influence of the animal. Highly interesting and significant figures have been obtained from the early production and relatively good persistency of the hybrid rye-grass strains.

These strains serve as a basis for technique trials, and interesting results are forthcoming relative to persistency under varying technique management. The trials to date show that much greater care is needed in grazing or in utilizing the shorter-lived hybrid strains of rye-grass as compared with the true perennial. The latter will withstand very much harder pruning than the hybrids, which tend to be eliminated rapidly under severe defoliation, particularly towards the end of their growth period in late spring.

These results are of high significance to the plant-breeder at this stage in the evolution of a short-rotation rye-grass and other bred strains.

(d) *Western Wolths.*—A new trial has been laid down to test the winter productivity of roughly selected Western Wolths rye-grass against pedigree Italian rye-grass, short-rotation rye-grass, and green oats. It is felt that before much breeding-work is done with Western Wolths rye-grass that the above winter production trials be carried out to see just what place Western Wolths will occupy in temporary winter pastures or cover-crop work.

(e) *Sheep-nutrition Area, Massey Agricultural College.*—The original strain trial has been ploughed and the area resown to two classes of rye-grass pastures that are to be managed in two different ways : (1) continuous grazing, and (2) rotational grazing. The two pasture series are to test what improvement, if any, can be effected in grazing-management and fat-lamb production by adding the new short-rotation rye-grass to the mixtures. The two mixtures sown are as follows : (1) pedigree perennial rye-grass, 40 lb. ; (2) pedigree perennial rye-grass, 20 lb., plus short-rotation rye-grass, 20 lb. Three pound of pedigree white clover has been included in both mixtures.

*Manurial Trials :* These are being continued, including measurement yields of pasture by frame enclosures. The significant feature of these trials to date is the relatively insignificant difference between 1 cwt. super. per acre and 4 cwt. super. per acre and the marked difference where lime is used in addition to the superphosphate. The following figures are relative yields : 1 cwt. super., 100 ; 4 cwt. super., 101 ; 4 cwt. basic slag, 105 ; 4 cwt. super. plus lime, 113 ; 4 cwt. super. plus lime and potash, 112.

(f) *Silage.*—Some 200 tons of silage has been made in fourteen pits and stacks varying in capacity from  $\frac{1}{2}$  ton to 50 tons. The work of other years has been repeated in an effort to establish norms over a number of seasons. Last year's results go to show that the loss in dry matter is still between 40 per cent. and 50 per cent., with the exception where acid was used, and the loss here is reduced to 7 per cent. in small 3-ton silos and 20 per cent. in 25-ton silos. The addition of whey or molasses has not reduced the dry-matter loss. Feeding trials were conducted of raw material and of the material after ensilation. The chemical analytical work relative to this investigation was done by the Chemical Laboratory.

(g) *Fodder and Cover Crops.*—Some preliminary work was attempted with cover-crop production, but the season was too wet to give comparative results. Feeding trials to determine digestibility and yield of strains of fodders were conducted at Palmerston North and at Lincoln in collaboration with the Agronomy Division. These crops include chou moellier, thousand-headed kale, Giant rape, and B.L.E. rape. Three acres of chou moellier (three strains) and thousand-headed kale were sown, tended, and weighed on the dairy-farm with a view to determining time of sowing in relation to summer production